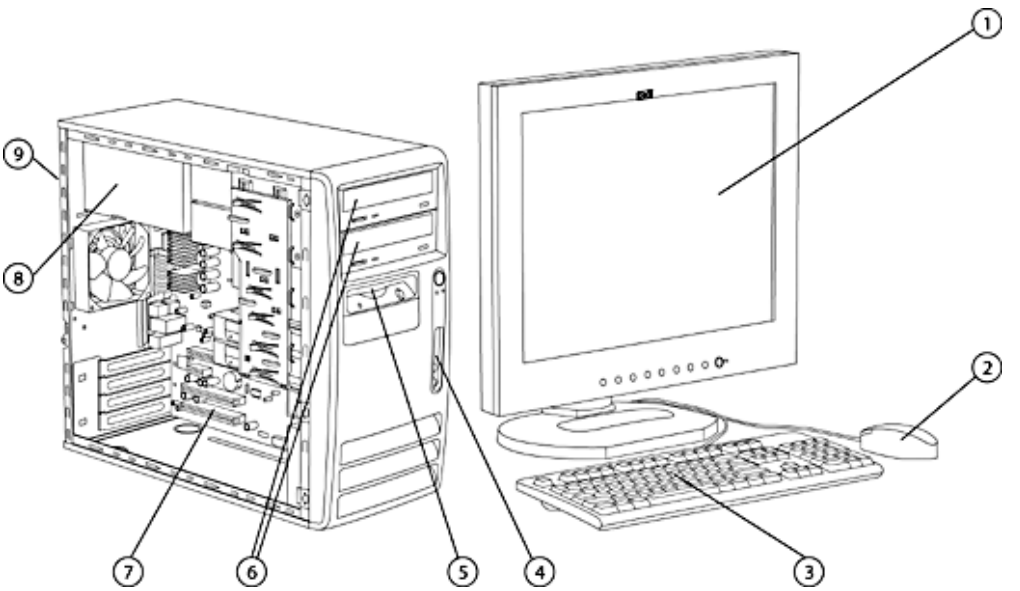
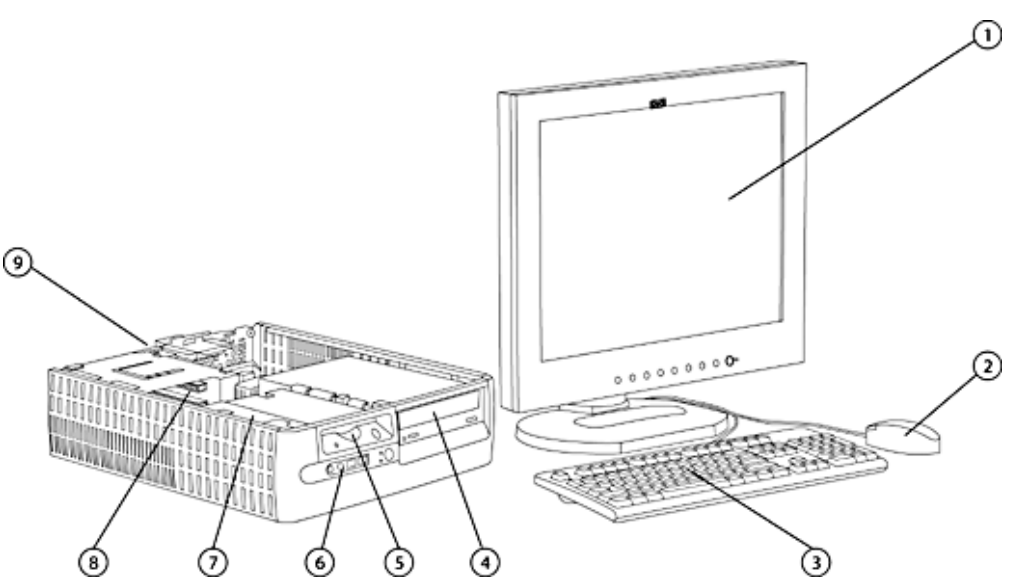
HP recommends
Windows Vista™ Business

Microtower




1. Monitor (sold separately)
2. 2-Button Scroll Mouse
3. 2004 Standard Keyboard
4. 2 USB 2.0, headphone and microphone
5. 2 3.5" external bays for optional diskette drive, 16-in-1 Media Card Reader, or other 3.5" device
6. 2 internal 3.5" bays and 2 external 5.25" bays
7. 2 full-height PCI slots , 1 x1 PCI-E, 1 x16 PCI-E
8. 250-watt PFC power supply
9. 6 USB 2.0, 1 standard serial port, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, 1 DVI-D , audio in/out, and microphone

Small Form Factor



*Overview*

1. Monitor (sold separately)
2. 2-Button Scroll Mouse
3. 2004 Standard Keyboard
4. 1 external 5.25" bay
5. 1 3.5" internal bay and 1 3.5" external bay for optional diskette drive, 16-in-1 Media Card Reader, or other 3.5" device
6. 2 USB 2.0, headphone and microphone
7. 2 LP PCI slots, 1 x1 LP PCI-E, 1 x16 LP PCI-E
8. 200-watt PFC power supply
9. 6 USB 2.0, 1 standard serial port, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, 1 DVI-D, audio in/out, and microphone

## At A Glance

- AMD Athlon™ 64 and Sempron™ processors with HyperTransport™ technology
- Operating Systems:
  Genuine Windows XP Professional SP2
  Genuine Windows Home Edition SP2
  Genuine Windows XP Professional x64 Edition
  SuSE Linux 9.3
  FreeDOS
- Support for AMD Enhanced Virus Protection™ and AMD Cool 'n Quiet™ technologies
- Integrated DDR I dual-channel memory controller
- ATI Radeon® Xpress 200M chipset
- Integrated Radeon X300 based graphics – standard VGA and DVI-D ports
- Supports up to 4-GB of PC 3200 (DDR 400) Synch DRAM Memory
- 6 rear USB 2.0 ports and 2 front USB 2.0 ports
- Realtek AC97 integrated audio with internal speaker
- Integrated PCI-E Broadcom NetXtreme Gigabit Ethernet NIC
- x1 and x16 PCI-Express slots
- Two 32-bit PCI slots
- In compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2002/95/EC
- In compliance with the IEEE 1680 (EPEAT) standard at the SILVER level, see http://www.epeat.net
- Energy Star compliant with energy-saving features
- Protected by HP Services, including a 3-3-3 standard warranty. Certain restrictions and exclusions apply.

## Pre-Configured Models

### Smart Buy Promotion Models

| English | French | Description |
|---|---|---|
| EN227UT#ABA | EN227UT#ABC | dx5150 SFF/Athlon64 4200X2/160GB/1GB/DVD+/-RW/XPP |
| PZ635UA#ABA | PZ635UA#ABC | dx5150 MT/Athlon64 3800X2/80GB/1GB/Combo/XPP |
| EN294UT#ABA | EN294UT#ABC | dx5150 MT/Athlon64 4200X2/80GB/1GB/Combo/XPP |

### Standard Models

| English | French | Description |
|---|---|---|
| PV750AA#ABA | PV750AA#ABC | dx5150M/AS-30/40hfc/256F/4 |
| PV753AA#ABA | PV753AA#ABC | dx5150M/A64-32/80hfw/512G/4 |
| PV754AA#ABA | PV754AA#ABC | dx5150M/A64-35/80hfw/512G/4 |
| ED648AA#ABA | ED648AA#ABC | dx5150S/AS-30/40hfc/256F/4 |
| ED649AA#ABA | ED649AA#ABC | dx5150S/A64-32/80hfw/512G/4 |
| ED650AA#ABA | ED650AA#ABC | dx5150S/A64-35/80hfw/512G/4 |

*Standard Features - Custom Components*

| | | | | | |
|---|---|---|---|---|---|
| **Processor and Speed** – One of the following | **AMD Sempron Processors** | **System Bus** | **Standard L2 Cache** | | |
| | AMD Sempron 3000+ (1.8GHz) | 1600 MHz | 128 KB | X | X |
| | AMD Sempron 3200+ (1.8 GHz) | 1600 MHz | 256 KB | X | X |
| | AMD Sempron 3500+ (2.0 GHz) | 1600 MHz | 256 KB | X | X |
| | **AMD Athlon Processors** | **System Bus** | **Standard L2 Cache** | | |
| | AMD Athlon 64 3000+ (1.8 GHz) | 2000 MHz | 512 KB | X | X |
| | AMD Athlon 64 3200+ (2.0 GHz) | 2000 MHz | 512 KB | X | X |
| | AMD Athlon 64 3500+ (2.2 GHz) | 2000 MHz | 512 KB | X | X |
| | AMD Athlon 64 3800+ (2.4 GHz) | 2000 MHz | 512 KB | X | X |
| | AMD Athlon 64 4000+ (2.4 GHz) | 2000 MHz | 1024 KB | X | X |
| | AMD Athlon 64 X2 Dual-Core 3800+ (2.0 GHz) | 2000 MHz | 512 KB x 2 | X | X |
| | AMD Athlon 64 X2 Dual-Core 4200+ (2.2 GHz) | 2000 MHz | 512 KB x 2 | X | X |
| | AMD Athlon 64 X2 Dual-Core 4400+ (2.2 GHz) | 2000 MHz | 1 MB x 2 | X | X |

| | | | |
|---|---|---|---|
| **Operating System** – One of the following | | **MT** | **SFF** |
| | Genuine Windows XP Professional with service pack 2 | X | X |
| | Genuine Windows XP Home with service pack 2 | X | X |
| | Genuine Windows XP Professional x64 Edition | X | X |
| | FreeDOS | X | X |
| | SuSE Linux Personal 9.3 OEM (delivered on CDs with system, not pre-installed) | X | X |

| | | | |
|---|---|---|---|
| **Serial ATA SMART Hard Drives** | 40GB Serial ATA Hard Drive (7200 rpm) | X | X |
| | 80GB Serial ATA Hard Drive (7200 rpm) | X | X |
| | 160GB Serial ATA Hard Drive (7200 rpm) | X | X |
| | 250GB Serial ATA Hard Drive (7200 rpm) | X | X |
| | 2nd hard drive, 40GB Serial ATA Hard Drive (7200 rpm) | X | X |
| | 2nd hard drive, 80GB Serial ATA Hard Drive (7200 rpm) | X | X |
| | 2nd hard drive, 160GB Serial ATA Hard Drive (7200 rpm) | X | X |
| | 2nd hard drive, 250GB Serial ATA Hard Drive (7200 rpm) | X | X |

*Standard Features - Custom Components*

| | | MT | SFF |
|---|---|---|---|
| **Standard Memory** – One of the following | 256-MB DDR Synch DRAM PC3200 (400-MHz) Non ECC (1 x 256 DIMM) | X | X |
| | 512-MB DDR Synch DRAM PC3200 (400-MHz) Non ECC (1 x 512 DIMM) | X | X |
| | 512-MB DDR Synch DRAM PC3200 (400-MHz) Non ECC (2 x 256 DIMM) | X | X |
| | 1-GB DDR Synch DRAM PC3200 (400-MHz) Non ECC (1 x 1024 DIMM) | X | X |
| | 1-GB DDR Synch DRAM PC3200 (400-MHz) Non ECC (2 x 512 DIMM) | X | X |
| | 2-GB DDR Synch DRAM PC3200 (400-MHz) Non ECC (2 x 1024 DIMM) | X | X |
| | 4-GB DDR Synch DRAM PC3200 (400-MHz) Non ECC (4 x 1024 DIMM) | X | X |
| **Removable Storage** | Optional 1.44-MB Diskette Drive | X | X |
| **Media Reader** | HP 16-in-1 Media Reader (PCI card supplies internal USB connection) | X | X |
| | | **MT** | **SFF** |
| **Optical Storage** - One of the following | 48X Max CD-ROM Drive | X | X |
| | 48X/32X/48X CD-RW Drive | X | X |
| | 16X/40X DVD-ROM Drive | X | X |
| | 48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive | X | X |
| | 16X DVD+R/+RW Drive | X | X |
| **I/O Card** | HP FireWire / IEEE 1394 PCI Card Full Height | X | |
| | HP FireWire / IEEE 1394 PCI Card Low Profile | | X |
| | | **MT** | **SFF** |
| **Keyboard** | Standard Keyboard PS/2 | X | X |
| | Standard Keyboard USB | X | X |
| | | **MT** | **SFF** |
| **Mouse** | PS/2 2-Button Scroll Mouse | X | X |
| | HP PS/2 2-Button Optical Scroll Mouse | X | X |
| | USB Optical Scroll Mouse | X | X |

*Standard Features - Custom Components*

| | | | |
|---|---|---|---|
| **Modem** | 2006 Agere PCI 56K International SoftModem (full height) | X | |
| | 2006 Agere PCI 56K International SoftModem (low profile) | | X |
| **Audio** | Integrated Realtek AC97 audio with premium internal speaker | X | X |
| **NIC** | | **MT** | **SFF** |
| | Integrated PCI-E Broadcom NetXtreme Gigabit Ethernet | X | X |
| | Intel PRO/1000 GT Gigabit PCI Adapter (full height bracket) | X | |
| | Intel PRO/1000 GT Gigabit PCI Adapter (low profile bracket) | | X |
| **Chipset** | ATI Radeon Xpress 200M | X | X |
| **Graphics** | Integrated Radeon X300 based graphics with standard VGA and DVI-D ports | X | X |
| | ATI Radeon X300 SE 128MB DDR FH PCIe DVI w/TV-out | X | |
| | ATI Radeon X300 SE 128MB DDR LP PCIe DVI w/TV-out | | X |
| | ATI Radeon X1300 256MB DDR LP PCIe DVI w/TV-out | X | X |
| | ATI Radeon X1600XT 256MB DDR FH dual head PCIe | X | |
| **Software** (Microsoft Windows system only) | | **MT** | **SFF** |
| | Norton Antivirus 2005 with 60 day Live Update Subscription | X | X |
| | Corel Word Perfect Office 11 | X | X |
| | Microsoft Office 2003 Basic | X | X |
| | Microsoft Office 2003 Professional | X | X |
| | Microsoft Office 2003 Small Business Edition | X | X |
| | Microsoft Works 8.5 | X | X |
| | Google Toolbar | X | X |
| | OpenOffice.org Office Suite | X | X |
| | NOTE: Microsoft Works 8.5 not available with Microsoft Windows XP Professional x64 Edition. | | |
| | NOTE: Office XP Small Business and Office Professional not available in all countries. | | |
| **Security** | Chassis Clamp Lock | X | X |
| | ProtectTools Embedded security module (TPM 1.1) | X | X |
| **Miscellaneous** | Tower Stand | | X |
| **Client Management Solutions** | For information about Client Management Solutions visit: www.hp.com/go/EasyDeploy. | X | X |

*Standard Features*

| Base Unit Contents | Microtower | Small Form Factor |
|---|---|---|
| AMD processor, heatsink | X | X |
| System board with ATI Radeon® Xpress 200M chipset | X | X |
| One PATA Cable | X | X |
| Optional diskette drive with cable | X | X |
| One SATA Cable | X | X |
| Quick Setup booklet | X | X |
| Getting Started guide | X | X |
| Product Documentation on CD | X | X |
| HP OS CD and HP Restore CD | X | X |
| Warranty booklet | X | X |
| Power Cord | X | X |
| Standard Keyboard PS/2 | X | X |
| PS/2 Scroll Mouse | X | X |

| Supported Operating System | | |
|---|---|---|
| DOS | No | No |
| Windows 3.1 | No | No |
| Windows 95 | No | No |
| Windows 98 | No | No |
| Windows NT 4.X | No | No |
| Windows 2000 / Windows XP Pro dual-install | No | No |
| Windows 2000 (Web Support) | Yes | Yes |
| Windows XP Professional SP2 | Yes | Yes |
| Windows XP Home SP2 | Yes | Yes |
| Windows XP Professional x64 Edition | Yes | Yes |
| SuSE Linux | Yes | Yes |

| Expansion Capability | | |
|---|---|---|
| Memory Expansion Slots (Non-ECC) | 4 DIMM slots | 4 DIMM slots |
| Maximum Memory | 4-GB (1-GB per slot maximum) | 4-GB (1-GB per slot maximum) |

| Slots | | |
|---|---|---|
| PCI | 2 full-height | 2 low-profile |
| PCI-Express | 1 x1 full-height, 1 x16 full-height | 1 x1 low-profile, 1 x16 low-profile |

| Bays | Total Bays = 6 | Total Bays = 3 |
|---|---|---|
| Internal | (2) 3.5-inch bays | (1) 3.5-inch bay |
| External | (2) full-length 5.25-inch | (1) full-length 5.25-inch |
| | (2) full-length 3.5-inch | (1) full-length 3.5-inch |

| Wireless Support | PCI card or external USB | PCI card or external USB |
|---|---|---|

*Standard Features*

| | | |
|---|---|---|
| USB Support | (2) Front USB 2.0 Ports | (2) Front USB 2.0 Ports |
| | (6) Rear USB 2.0 Ports | (6) Rear USB 2.0 Ports |

| Interfaces (Legacy) | | |
|---|---|---|
| Parallel Port | 1 | 1 |
| Serial Port | 1 | 1 |
| PS/2 Keyboard | 1 | 1 |
| PS/2 Mouse | 1 | 1 |
| VGA/DVI-D Port | 1/1 | 1/1 |

| Dimensions | | |
|---|---|---|
| Chassis Dimensions (H x W x D) Centimeters | 36.8 x 17.5 x 42.0 | 10.3 x 33.78 x 38.35 |
| Chassis Dimensions (H x W x D) Inches | 14.5 x 6.88 x 16.5 | 3.95 x 13.3 x 15.1 |
| System Weight | 23.8 lb (10.8 kg) | 21 lb (9.53 kg) |
| System Volume | 1651 sq. in. (27.0 liters) | 795 sq. in. (13 liters) |
| Shipping Weight | 32 lb (14.51 kg) | 28 lb (12.7 kg) |
| Packaged Unit Dimensions (H x W x D) | 22.20 x 13.00 x 23.50 in (56.39 x 33.02 x 59.69 cm) | 12.6 x 19 x 20 in (32 x 48.26 x 50.8 cm) |

| System Memory | | |
|---|---|---|
| Type/Speed | DDR I Synch DRAM PC3200 (400-MHz) Non-ECC | DDR I Synch DRAM PC3200 (400-MHz) Non-ECC |
| Maximum Memory | 4 GB (1-GB per slot maximum) | 4 GB (1-GB per slot maximum) |
| Memory Parity | Not Needed for non-ECC | Not Needed for non-ECC |
| ECC Memory | Not Supported | Not Supported |
| Serial Presence Detect Support | Supported | Supported |
| Dual channel memory Support | Yes. Requires two identical (size and technology) memory modules. | Yes. Requires two identical (size and technology) memory modules. |

| Supported Features | | |
|---|---|---|
| Processor | AMD Sempron™ and AMD Athlon™ 64 | AMD Sempron™ and AMD Athlon™ 64 |
| CPU Bus Speed Supported | AMD Sempron - 1600-MHz System Bus AMD Athlon - 2000-MHz System Bus | AMD Sempron - 1600-MHz System Bus AMD Athlon - 2000-MHz System Bus |
| Memory Type Supported | DDR 1 (non-ECC) | DDR 1 (non-ECC) |
| Memory Speed Supported | DDR Synch DRAM PC3200 (400 MHz) | DDR Synch DRAM PC3200 (400 MHz) |
| Serial Presence Detect Support | Yes | Yes |
| Hard Drive Interfaces Supported | SMART III SATA 1.5Gb/s | SMART III SATA 1.5Gb/s |
| Hard Drive Controller (PCI) Supported | Serial ATA (SATA) 1.5Gb/s | Serial ATA (SATA) 1.5Gb/s |

*Standard Features*

| AMD Sempron™ | | |
|---|---|---|
| 32-bit/64-bit support | 32-bit | 32-bit |
| Coprocessor | Integrated | Integrated |
| CPU Socket Type/Number | 939-pin | 939-pin |
| CPU Package | FC-PGA | FC-PGA |
| System Bus Speed | 1600 MHz | 1600 MHz |
| Standard L2 Cache | 128-KB or 256-KB, depending on processor | 128-KB or 256-KB, depending on processor |
| AMD Enhanced Virus Protection | Yes | Yes |
| AMD Cool 'n Quiet™ | Yes | Yes |
| L2 Cache Architecture / Speed | Full core clock speed | Full core clock speed |
| Cache Upgradeable To | Not upgradeable - Integrated into Processor | Not upgradeable - Integrated into Processor |
| Energy Star Qualified | Yes | Yes |

| AMD Athlon™ 64 | | |
|---|---|---|
| 32-bit/64-bit support | 32-bit and 64-bit | 32-bit and 64-bit |
| Coprocessor | Integrated | Integrated |
| CPU Socket Type/Number | 939-pin | 939-pin |
| CPU Package | FC-PGA | FC-PGA |
| System Bus Speed | 2000 MHz | 2000 MHz |
| Standard L2 Cache | 512-KB | 512-KB |
| AMD Enhanced Virus Protection | Yes | Yes |
| AMD Cool 'n Quiet | Yes | Yes |
| L2 Cache Architecture / Speed | Full core clock speed | Full core clock speed |
| Cache Upgradeable To | Not upgradeable - Integrated into Processor | Not upgradeable - Integrated into Processor |
| Energy Star Qualified | Yes | Yes |

| System Board | | |
|---|---|---|
| Architecture | AMD Athlon 64/Sempron/PCI/PCI-Express | AMD Athlon 64/Sempron/PCI/PCI-Express |
| Chipset | ATI Radeon® Xpress 200M | ATI Radeon® Xpress 200M |
| I/O Controller | SMSC LPC47B397 Super I/O | SMSC LPC47B397 Super I/O |
| System Board Form Factor | Standard uATX | Standard uATX |
| Processor Socket - 939 Pin ZIF | Yes | Yes |
| DIMM Connectors (2.5V) | Yes (4) | Yes (4) |
| PCI-Express Connector | Yes (1) X1 and (1) X16 | Yes (1) X1 and (1) X16 |
| Integrated PCI-E Graphics | Yes | Yes |
| PCI Connectors (32 bit) | Yes (2 on system board) | Yes (2 on system board) |
| Flash ROM (LPC based) | Yes | Yes |
| Audio | Yes | Yes |
| CD ROM IN (Audio) | Yes (2) | Yes (2) |
| Clear CMOS | Yes | Yes |
| CPU Fan Header | Yes | Yes |
| Chassis Fan Header | Yes | Yes |
| CMOS Battery Holder - Lithium | Yes | Yes |
| Hood Lock Header | No | No |
| Hood Sense Header | No | No |

*Standard Features*

| | | |
|---|---|---|
| Multibay Header | No | No |
| Multport Header | No | No |
| NIC supported features: | | |
| WOL (Wake-On-Lan®) | Yes | Yes |
| AOL (Alert-On-LAN®) | No | No |
| SOS - Network based alerting | Yes | Yes |
| ASF 1.0 (Alert Standards Format) | Yes | Yes |
| PXE (Pre-Boot Execution Environment) | Yes | Yes |
| Power Supply Header | Yes | Yes |
| Power Switch, Power LED & Hard Drive LED Header | Yes | Yes |
| Password Clear Header | Yes | Yes |
| Riser Connector | No | No |
| SCSI LED Header | Yes | Yes |
| ACPI-Ready Hardware<br>• Advanced Configuration and Power Management Interface (ACPI).<br>• It allows the system to wake from a low power mode.<br>• It controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. | Yes | Yes |
| Dual-State Power Button<br>• Power button acts as both an on/off button and suspend-to-sleep button. | Yes | Yes |

| Chassis | | |
|---|---|---|
| Colour | Carbonite/Silver | Carbonite/Silver |
| System Board Form Factors Supported | Standard uATX | Standard uATX |
| Cooling Solutions Supported | Yes | Yes |
| Power Supply Fan (Variable Speed) | Yes | Yes |
| Processor Fan-Heatsink (Variable Speed) | Yes | Yes |
| System Fan (Variable Speed) | Standard Front Headphone, Microphone, and (2) USB 2.0 | Standard Front Headphone, Microphone, and (2) USB 2.0 |
| Front I/O | Standard ATX I/O Connectors (6 USB 2.0, 1 VGA, 1 DVI-D, 1 Audio Out, 1 Audio In, 1 Microphone, 1 Serial, 1 Parallel, 2 PS2, 1 RJ-45) | Standard ATX I/O Connectors (6 USB 2.0, 1 VGA, 1 DVI-D, 1 Audio Out, 1 Audio In, 1 Microphone, 1 Serial, 1 Parallel, 2 PS2, 1 RJ-45) |
| Rear I/O | Yes | Yes |
| Internal Speaker | Kensington Cable Lock (optional) | Kensington Cable Lock (optional) |
| Security Locks Supported | Hood Cover Security Loop (standard but Lock not included) | Hood Cover Security Loop (standard but Lock not included) |

*Standard Features*

| Interfaces | | |
|---|---|---|
| I/O Chip | SMSC LPC47B397 Super I/O | SMSC LPC47B397 Super I/O |
| Serial Port / UART Type | One Serial Port | One Serial Port |
| Parallel Port | One Parallel Port | One Parallel Port |
| USB | 8 USB 2.0 ports (6 rear/2 front) | 8 USB 2.0 ports (6 rear/2 front) |
| Infrared Port | No | No |
| Network | RJ-45 | RJ-45 |
| Keyboard | Yes (PS2 and USB) | Yes (PS2 and USB) |
| Mouse | Yes (PS2 and USB) | Yes (PS2 and USB) |
| Multibay | No | No |
| Video (VGA/DVI-D) | Yes/Yes | Yes/Yes |
| Audio | Yes | Yes |

| Unit Environment and Operating Conditions | Microtower | Slim Tower |
|---|---|---|

General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

| Power Supply | | |
|---|---|---|
| Power Supply | 250-watt ATX power supply - PFC 115v/230v line switch | 200-watt ATX power supply - PFC 115v/230v line switch |
| Full Ranging Input (No Line Select Switch) | No | No |
| Active Power Factor Correction (APFC) (Input Current is nearly 1/2 a non-APFC PS) | No | No |
| Passive Power Factor Correction (PFC) | Yes (with line switch set to 230V - No PFC in 115V line switch position) | Yes (with line switch set to 230V - No PFC in 115V line switch position) |
| Operating Voltage Range | 90 to 132VAC, or 180 to 264VAC | 90 to 132VAC, or 180 to 264VAC |
| Rated Voltage Range | 100 to 127VAC, or 200 to 240VAC | 100 to 127VAC, or 200 to 240VAC |
| Rated Line Frequency | 50-60 Hz | 50-60 Hz |
| Operating Line Frequency Range | 47-63 Hz | 47-63 Hz |
| Rated Input Current | 5A @ 100VAC/2.5A @ 200VAC | 6A @ 115VAC/23.0A @ 230VAC |
| Maximum Rated Power | 250 watt | 200 watt |
| Heat Dissipation | Maximum 1260 BTU/hr, 317 kg-cal/hr Typical 256 BTU/hr, 65kg-cal/hr | Maximum 971 BTU/hr, 245kg-cal/hr, Typical 256 BTU/hr , 65kg-cal/hr |
| PS Fan | Variable speed fan | Variable speed fan |
| Processor Fan | Variable speed fan | Variable speed fan |

*Standard Features*

| Power Conservation 'Energy Saver' | | |
|---|---|---|
| Energy Star Compliant | Yes | Yes |
| APM 1.2 Support | No | No |
| Screen Blanking | Yes | Yes |
| Hard Disk 'Idle' Mode | Yes | Yes |
| System Idle Mode | Yes | Yes |
| Cache Memory Power-Down | No | No |
| FEMP Standby Power Compliance (<2W in S5-Power Off)** | Yes | Yes |
| Blue Angel Compliant (<5w in S5--Power Off) | Yes | Yes |
| Power Consumption in ES Mode - Suspend to RAM (S3) (Instantly Available PC) | ~2W | ~2W |
| Processor/Cache Memory Power-Down (S3) | Yes | Yes |
| CD-Rom Spins Down when not in use | Yes | Yes |
| **NOTE: Power consumption in the Off/Apparent Off mode is measured and reported with the network interface controller "Wake on LAN" feature disabled in F10 Setup (default is "enabled"). | | |

| Client Management Solutions | | |
|---|---|---|
| Client Management Solutions Home Page | http://h18000.www1.hp.com/im/ | http://h18000.www1.hp.com/im/ |
| HP Client Manager | Yes (via web download) | Yes (via web download) |
| Altiris Deployment Solution | Trial Version - 30 Days | Trial Version - 30 Days |
| Altiris Local Recovery | No | No |
| Plug and Play Ready | Yes | Yes |

| Boot Support | | |
|---|---|---|
| Local Diskette Boot | Yes | Yes |
| Local CD Boot | Yes | Yes |
| Local USB Boot | Yes | Yes |
| Network Boot | Yes | Yes |

*After-Market Options*

| | | MT | SFF | Part Number |
|---|---|---|---|---|
| Communications | NICs | | | |
| | Broadcom NetXtreme Gb Ethernet PCI-E Adapter | X | X | EA833A |
| | Intel Pro 1000 PT Gb Ethernet PCIe NIC | X | X | EH352AA |
| | Wireless LAN | | | |
| | Wireless A+G PCI Adapter | X | X | EA118AA |
| | Modem | | | |
| | PCI High-Speed 56K International SoftModem (includes low profile bracket) | X | X | EK694AA |
| | Connectivity | | | |
| | Bundle Connectivity Starter Kit - Surge Protector/LAN cable/Printer cable | X | X | RT174AA |

| Graphics | | MT | SFF | Part Number |
|---|---|---|---|---|
| | ATI RADEON X1300 256MB DDR PCIE DVI w/TV | X | X | AG392AA |
| | NVIDIA Quadro 280NVS 64MB PCI Dual Head (DMS59 connector with VGA Y-cable) | X | X | DY599A |

| Hard Drives | Serial ATA SMART III Hard Drives | | | |
|---|---|---|---|---|
| | 80-GB SATA 3.0-Gb/s Hard Drive (7200 rpm) | X | X | PY276AA |
| | 160-GB SATA 3.0-Gb/s Hard Drive (7200 rpm) | X | X | PY277AA |
| | 250-GB ATA/100 Hard Drive (7200 rpm) | X | X | PY278AA |

| Input/Output Devices | Keyboards | MT | SFF | Part Number |
|---|---|---|---|---|
| | HP PS/2 2004 Standard Keyboard | X | X | DT527A#ABA |
| | HP USB 2004 Standard Keyboard | X | X | DT528A#ABA |
| | USB Smartcard Keyboard | X | X | ED707AA#ABA |
| | Pointing Devices | | | |
| | HP PS/2 2-Button Scroll Mouse (Carbonite) | X | X | DD440B |
| | HP PS/2 2-Button Optical Scroll Mouse | X | X | EY703AA |
| | HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver) | X | X | DC172B |

| Memory (DIMMs) | 400-MHz (PC3200) DDR DIMMs Non-ECC | | | |
|---|---|---|---|---|
| | 256-MB DDR Synch DRAM PC3200 (DDR400) | X | X | DE466G |
| | 512-MB DDR Synch DRAM PC3200 (DDR400) | X | X | DE467G |
| | 1-GB DDR Synch DRAM PC3200 (DDR400) | X | X | DE468G |

*After-Market Options*

| | | | | |
|---|---|---|---|---|
| **Monitors** | **CRTs** | | | |
| | HP s7540 17" (16.0" vis) CRT Monitor | | | PF997AA#ABA |
| | **TFTs** | | | |
| | HP L1506 15" TFT Flat Panel Monitor – Analog only | | | PX848AA#ABA |
| | HP L1706 17" TFT Flat Panel Monitor – Analog only | | | PX849AA#ABA |
| | HP L1740 17" TFT Flat Panel Display – Analog/Digital | | | PL766AA#ABA |
| | HP L1745 17" TFT Flat Panel Display – Analog/Digital | | | GE178AA#ABA |
| | HP L1906 19" TFT Flat Panel Display – Analog only | | | PX850AA#ABA |
| | HP L1940T 19" TFT Flat Panel Display – Analog/Digital | | | EM869AA#ABA |
| | HP LP1965 19" TFT Flat Panel Display – Analog/Digital | | | RA373AA#ABA |
| | HP LP2065 20" TFT Flat Panel Display – Analog/Digital | | | EF227A4#ABA |
| | **Widescreen TFTs** | | | |
| | HP L2045w 20" Widescreen Flat Panel Display – Analog/Digital | | | RD125AA#ABA |
| | HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital | | | EF224A4#ABA |
| | HP LP3065 30" TFT Widescreen Flat Panel Display – Analog/Digital | | | EZ320A4#ABA |
| | **GSA Monitors** | | | 3PO Offering |
| | **Touchscreen TFT** | | | |
| | HP L5006tm 15" Touch Screen Flat Panel Display | | | RB146AA#ABA |
| | **Options** | | | |
| | HP Flat Panel Speaker Bar | | | EE418AA |
| **Multimedia** | HP USB Powered Speakers | X | X | RD628AA |
| | HP 16-in-1 Media Card Reader with PCI Card | X | X | EM718AA |
| **Optical Drives** | **DVD-ROM Drive** | **MT** | **SFF** | **Part Number** |
| | 16X/48X DVD-ROM w/ +R read | X | X | PR596A |
| | **Combo Drive** | | | |
| | 48X/32X Combo DVD-ROM/CD-RW Drive | X | X | DL976B |
| | **DVD+R/+RW Drive** | | | |
| | 16X DVD+R/+RW Drive (LS/DL/DF) | X | X | PR595A |
| **Removable Storage** | **Diskette and Digital Drives** | **MT** | **SFF** | **Part Number** |
| | 1.44-MB Internal Floppy Drive | X | | AG295AA |
| | 1.44-MB Internal Floppy Drive | | X | AG296AA |
| | 1.44-MB USB Floppy Drive – External | X | X | DC141B |
| **Security** | | **MT** | **SFF** | **Part Number** |
| | Security cable with Kensington lock | X | X | PC766A |
| | HP Business PC Security Lock Kit | X | X | TBD |
| | Wall Mount/Security Sleev | | X | DK412A |

*After-Market Options*

| | | | | |
|---|---|---|---|---|
| **Software** | HP Client Foundation Suite<br>HP Client Manager<br>HP Systems Insight Manager Connector<br>Altiris Local Recovery Pro (not qualified on HP dx5150 Business PC)<br>Altiris Migration Suite | X | X | EF117AA<br>(use EF118AA for 1000+ licenses) |
| | HP Client Premium Suite<br>HP Client Manager<br>HP Systems Insight Manager Connector<br>Altiris Local Recovery Pro (not qualified on HP dx5150 Business PC)<br>Altiris Migration Suite<br>Altiris Connector Solution<br>Altiris Client Management Suite Level 1<br>HP OpenView Connector | X | X | EF119AA<br>(use EF120AA for 1000+ licenses) |

| **Miscellaneous Accessories** | | **MT** | **SFF** | **Part Number** |
|---|---|---|---|---|
| | HP FireWire / IEEE 1394 PCI Card | X | X | PA997A |
| | USB to Serial Adapter, 3ft | X | X | EM449AA |
| | Cat5e Patch Cable | X | X | AH122AA |
| | Firewire (1394) Cable | X | X | AH123AA |
| | 7-outlet Surge Protector | X | X | AG290AA#ABA |

| **Brackets/Stands** | | **MT** | **SFF** | **Part Number** |
|---|---|---|---|---|
| | Tower Stand (Carbonite) | | X | DE870A |
| | 5.25" Blank Bezel Kit (Carbonite 50/Bulk Pack) | X | X | DC177B |
| **HP Care Pack Services** | | **MT** | **SFF** | **Part Number** |
| | 4hr, 9x5 onsite, HW Support, CPU Only, 3 yrs | X | X | U4863E |
| | 4hr, 9x5 onsite, HW Support, CPU Only, 4 yrs | X | X | U7902E |
| | 4hr, 9x5 onsite, HW Support, CPU Only, 5 yrs | X | X | U7904E |
| | 4 hr onsite response, 24x7, CPU only, 3 yrs | X | X | H4493E |
| | 4 hr onsite response, 24x7, CPU only, 4 yrs | X | X | U7906E |
| | 4 hr onsite response, 24x7, CPU only, 5 yrs | X | X | U7908E |
| | Basic 8x5, 4 hr onsite response, 3 yrs | X | X | U4864E |
| | Basic 8x5, 4 hr onsite response, 4 yrs | X | X | U7901E |
| | Basic 8x5, 4 hr onsite response, 5 yrs | X | X | U7903E |
| | 4 hr onsite, extended hours response, 3 yrs | X | X | U5868E |
| | 4 hr onsite, extended hours response, 4 yrs | X | X | U7900E |
| | 4 hr onsite response, 24x7, 3 yrs | X | X | H4483E |
| | 4 hr onsite response, 24x7, 4 yrs | X | X | U7905E |
| | 4 hr onsite response, 24x7, 5 yrs | X | X | U7907E |
| | Next day onsite response, CPU only, 3 yrs | X | X | U8316E |
| | Next business day onsite, HW Support, CPU only, 4 yrs | X | X | U7897E |
| | Next business day onsite, HW Support, CPU only, 5 yrs | X | X | U7899E |
| | Next day onsite response, 4 yrs | X | X | U7896E |

*After-Market Options*

| | | | |
|---|---|---|---|
| Next day onsite response, 5 yrs | X | X | U7898E |
| Post warranty service, Next day Onsite, CPU only | X | X | U5864PE |
| Post warranty service, next day onsite | X | X | U5865PE |
| Post warranty service, 4 hour, 9x5 onsite, HW support | X | X | U4859PE |
| Installation for 2+ HP desktop or laptop; Basic | X | X | U5870E |
| Installation for 1 HP desktop or laptop; Basic | X | X | U5869E |

Memory Controller is integrated in the Processor (Supports DDR I type memories up to PC3200 (400 Mhz)
DDR SYNCH DRAM DIMM NON-ECC MEMORY

The HP business desktop dx5150 PC has four memory DIMM slots and supports dual channel memory configurations. It is required to add memory in pairs; memory should be added in pairs and should be the same type. For example, 2x128-MB memory modules will perform better on some applications than 1x256-MB memory module because of the dual channel memory support on the dx5150.

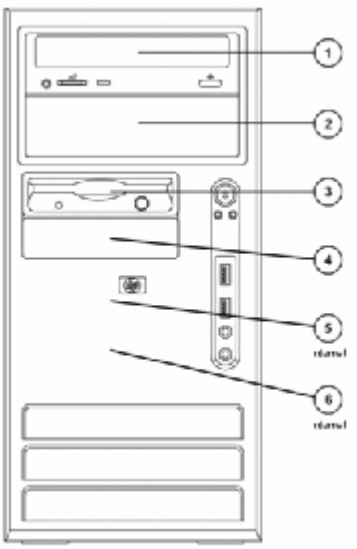
STANDARD MEMORY

Configurations can be selected with a 256-MB, 512-MB, 1024-MB, or 2048-MB memory. Memory types supported include PC3200 (DDR 400)

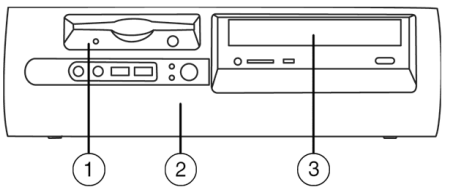
Various combinations of single-DIMM (for future upgradeability) and double-DIMM (for enhanced dual-channel memory performance) will be offered. There are four DIMM slots available. 2 Of them are black, and two of them are blue to indicate the two different channels. For best performance populate the DIMMs in pairs (Make sure to use identical memory DIMMs). Also, if only Two single sided matched pairs are used place them in the Black Slots. Refer to the dx5150 service guide or the Hardware reference guide for supported memory configurations.

*Storage*

Microtower



Small Form Factor



| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| **Microtower** | | | |
| Diskette Drive<br>or<br>Media Reader | 2 | 3. 4 | Diskette<br><br>PCI card supplies internal USB 2.0 port |
| 5.25" Storage Bays | 2 | 1, 2 | IDE |
| 3.5" Storage Bay | 2 | 5, 6 | SATA |
| **Small Form Factor** | | | |
| Diskette Drive<br>or<br>Media Reader | 1 | 1 | Diskette<br><br>PCI card supplies internal USB 2.0 port |
| 5.25" Storage Bays | 1 | 3 | IDE |
| 3.5" Storage Bay | 1 | 2 | SATA |

| ROM Features | Description | Microtower | Small Form Factor |
|---|---|---|---|
| Instantly Available PC (Suspend to RAM - S3) | Allows for very low power consumption with quick resume time | Yes | Yes |
| Replicated Setup | Saves BIOS settings to diskette or USB disk-on-key in human-readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM based F10 Setup | No | No |
| Remote System Installation via F12 (PXE) | Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server | Yes | Yes |
| Failsafe Boot Block ROM | — | Yes | Yes |
| Emergency ROM Flash Recovery (BootBlock) | User is alerted with audible tones and front panel LEDs only | Yes | Yes |
| Save and Restore CMOS Setup via Diskette | Tool will be available in the website | Yes | Yes |
| Auto Setup when New Hardware Installed | System automatically detects addition of new hardware (e.g. memory, floppy, etc.) | Yes | Yes |
| Serial, Parallel, USB Enable/Disable Port Control | Allows the user to enable or disable serial, parallel or USB ports | Yes | Yes |
| Removable Media Boot Control | Prevents the computer from being booted from removable media on supported devices (and can disable writes to media) | No | No |
| Remote Boot from Server | Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server | Yes | Yes |
| Keyboard-less boot-up | Allows for secured keyboard-less network operation | Yes | Yes |
| User Password | Prevents an unauthorized person from booting up the computer | Yes | Yes |
| Supervisor Password | Prevents an unauthorized person from changing the system configuration | Yes | Yes |
| Master Boot Record Security | Allows for detection of changes to MBR and optional restoration, useful in protecting from viruses | Yes | Yes |
| Power Management | | Yes | Yes |
| ACPI Ready | | Yes | Yes |
| SMBIOS (previously known a DMI) | System Management BIOS, previously known as DMI BIOS, for system management information | Yes | Yes |
| Keyboard-less Operation | The system can be operated without a keyboard | Yes | Yes |
| Remote ROM Flash | Provides secure, fail-safe ROM image management from a central network console | Yes | Yes |
| Remote Wakeup / Remote Shutdown | • Allow a system administrator to power on, restart, and power off a client computer from a remote location.<br>• This enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM. | Yes | Yes |
| ROM Based Setup (F10) and Start-up Diagnostics | | Yes | Yes |
| Acoustics: Advanced Power Management - On | Seated operator position | Idle (Hard drive spinning but not seeking) = 29dBA | Idle (Hard drive spinning but not seeking) = 29dBA |

*Technical Specifications*

| Unit Environment and Operating Conditions | Description | Microtower | Small Form Factor |
|---|---|---|---|
| Shock | | | |
| Operating (*Using 11-ms half-sine shock pulse) | 6 faces,11 ms, 1/2 Sine, 10 shocks per face,5G during Read, 1G during Write (with no damage being incurred) | Yes | Yes |
| Non-Operating (*Using 11-ms half-sine shock pulse) | 6 faces,2 ms < pulse duration < 3 ms (with no damage being incurred) | Yes | Yes |
| Vibration | | | |
| Operating | Random vibration at 10Hz to 500Hz, (0.25G's nominal) | Yes | Yes |
| Non-Operating | Random vibration at 10Hz to 500Hz, (0.5G's nominal) | Yes | Yes |
| Relative Humidity | | | |
| Operating (maximum wet bulb temp., non-condensing) | 10°C - 35°C; 10% - 90% non condensing. | Yes | Yes |
| Non-operating (maximum wet bulb temp., non-condensing) | -30°C -90°C ;10%~95% R.H. non condensing. | Yes | Yes |
| Altitude Max (un-pressurized) | | | |
| Operating (Maximum allowable altitude change rate is 1500 ft/min.) | 0 to 3,048 meters/10,000 feet - This value may be limited by the type and number of options installed. | Yes | Yes |
| Non-operating (Maximum allowable altitude change rate is 1500 ft/min.) | 0 to 9144meters/30,000 feet - This value may be limited by the type and number of options installed. | Yes | Yes |

| Initial Configuration and Deployment | Description | Microtower | Small Form Factor |
|---|---|---|---|
| Replicated Setup | Saves BIOS settings to diskette. A Windows or DOS based utility can replicate these settings on machines being deployed without entering ROM based F10 Setup. | Yes, utility available on HP.com | Yes, utility available on HP.com |
| Support Software CD | — | Yes | Yes |
| HP Software Restore CD | Allows the computer to be restored to its original factory shipping image | | |
| Altiris Deployment Solutions (30-day trial version) | A suite of solutions that focus on business needs in four areas, saving time and freeing resources to address other crucial issues:<br>• Deployment & Migration<br>• Software & Operations Management<br>• Inventory & Asset Management<br>• Help Desk & Problem Resolution | Yes | Yes |
| Asset Tag | • Intended to be used as a repository for storing company-specific property asset numbers for easy tracking<br>• Initially set equal to the system serial number<br>• Stored in a protected section of non-volatile memory which can be accessed and modified with the F10 Setup program | Yes | Yes |

| | | | |
|---|---|---|---|
| DIMM Serial Presence Detect | Detects whether or not memory DIMMs are present and their type | No | No |
| Hard drive serial number, model, and manufacturer | Hard drive manufacturer, model, and serial number is stored in the hard drive firmware and reported in ROM based F10 setup | No | No |
| Monitor serial number, model & manufacturer | — | No | No |
| System serial number, model, & manufacturer | System serial number, model, & manufacturer stored in a non-volatile memory and can be retrieved with management software or viewed in ROM based F10 setup | Yes | Yes |
| ROM revision levels | • System ROM revision levels are identified by a version number (xx.yy) and reported in ROM based F10 Setup<br>• Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information | Yes | Yes |
| System board revision level | • Allows management SW to read the revision level of the system board<br>• Revision level is digitally encoded into the hardware and cannot be modified | Yes | Yes |
| Memory Change Alert (Intelligent Manageability needed to work) | Alerts management console if memory is removed or changed | Yes | Yes |

| Security Features of Chassis | Description | Microtower | Small Form Factor |
|---|---|---|---|
| Solenoid Hood Lock | — | No | No |
| Hood Sensor | — | No | No |
| Kensington Lock Support | — | Yes | Yes |
| Cable Lock Provision | Allows the user to physically secure computer hardware from theft via a loop on the chassis. With lock installed, this loop also prevents the hood from being removed. | Yes | Yes |
| Serial, Parallel, USB Enable/Disable | Allows the user to enable or disable serial, parallel or USB ports and hide them from the operating system | Yes | Yes |
| Port Control | Device which attaches to back of chassis covering external ports and thereby preventing unauthorized access; also aids in cable management | No | No |
| Removable Media Write / Boot Control | Prevents the computer from being booted from removable media on supported devices (and can disable writes to media) | No | No |
| Power-On Password | Prevents an unauthorized person from booting up the computer | Yes | Yes |
| Setup Password | Prevents an unauthorized person from changing the system configuration | Yes | Yes |
| SmartCard Reader | Security device that prevents system access into the operating system unless the user has the appropriate Smartcard | No | No |
| SMART Hard Drives, Fault Notification, & Prefailure Warranty | • Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted<br>• Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count<br>• By helping users avoid actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure | Yes | Yes |
| Surge Tolerant Full Ranging Power Supply | Withstands power surges up to 2000V | Yes | Yes |

| | | | |
|---|---|---|---|
| Ultra ATA Integrity Monitoring (CRC Checking) | • Provides data transfer verification.<br>• Provides proactive notification of hard drive data transmission problems and recommendations for enhancing system performance<br>• Detects all the following errors types:<br>o single bit errors<br>o double bit errors<br>o an odd number of errors<br>o error bursts up to 32-bits long | Yes | Yes |
| Integrated SATA RAID Controller | RAID-0/1. User-configurable with matching 2nd HDD configuration | Yes | Yes |
| Support Software CD & website | www.hp.com/support | Yes | Yes |

| Serviceability Features of System | Description | Microtower | Small Form Factor |
|---|---|---|---|
| Dual Colour Power LED on Front of Computer | Indicates normal operations and fault conditions | Yes | Yes |
| Blinking Power LED Codes | Allows for easy problem resolution | Yes | Yes |
| Diagnostic LED Explanation Table | Number of 1-second blinks (red LED) Diagnosis - followed by a 2 second pause/ repeat:<br>2 = Processor Thermal Protection Activated<br>3 = Processor not installed<br>4 = Power Supply Failure<br>5 = Memory Error<br>6 = Video Error<br>7 = PCA failure (ROM detected failure prior to video)<br>8 = Invalid ROM, bootblock recover mode | Yes | Yes |
| Emergency ROM Flash Recovery | — | Yes | Yes |
| Compaq Diagnostic for Windows Software | — | Yes | Yes |
| System Shutdown at Over-Temp | — | Yes | Yes |
| HP OS CD (Restore OS CD) | Allows the computer to be restored to its original factory shipping image | Yes | Yes |
| HP Restore CD (Restores Drivers CD) | Allows the computer to be restored to its original factory shipping image | Yes | Yes |
| Flash ROM | — | Yes | Yes |
| 5V Aux Power LED on System PCA | — | Yes | Yes |
| Diagnostic Power Switch LED on board | — | Yes | Yes |
| Clear Password Jumper | — | Yes | Yes |
| Clear CMOS Button | — | Yes | Yes |
| CMOS Battery Holder for easy Replacement | — | Yes | Yes |
| Processor ZIP Socket for easy Upgrade | — | Yes | Yes |
| DIMM Connectors for easy Upgrade | — | Yes | Yes |

| | | | |
|---|---|---|---|
| NIC LEDs (integrated) (Green & Amber) | Used to determine NIC status | Yes | Yes |

| Serviceability Features | Description | Microtower | Small Form Factor |
|---|---|---|---|
| Tool-less PCI Card Removal | — | No | Yes |
| Tool-less PCI-E Card Removal | — | No | Yes |
| Dual Colour Power LED | Indicates Normal Operations and Fault Conditions | Yes | Yes |
| Diagnostic LED Explanation Table | — | Yes | Yes |
| Emergency ROM Flash Recovery | — | Yes | Yes |
| Solenoid Hood Lock | Remote operated system lock | No | No |
| Green Pull Tabs, and Quick Release Latches for easy Identification | — | Yes | Yes |
| System memory can be upgraded without removing the system board or any internal components | Eases memory upgrading | Yes | Yes |
| Tool-less Hood Removal | Eases entry to the chassis without use of special tools | Yes | Yes |
| Tool-less Hard Drive, CD & Diskette Removal | No special tools required for removal of devices in the 3.5" and 5.25" bays | Yes | Yes |
| Tool-less System Board Removal | No special tools required for system board removal | No | No |
| Industry-standard CD Bay | — | Yes | Yes |
| Drive Self Tests (DPS) | • Drive Protection System<br>• A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user.<br>• Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard disk drive is the source of the problem and needs to be replaced.<br>• The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures | Yes | Yes |
| DPS Access through F10 Setup during Boot | | Yes | Yes |
| SMART Technology (Self-Monitoring, Analysis and Reporting Technology) | • Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted<br>• Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count<br>• By helping users avoid actual hard drive failures, SMART hard drives provide protection against unplanned user downtime and potential data loss from hard drive failure | Yes | Yes |
| SMART I - Drive Failure Prediction | | Yes | Yes |
| SMART II - Off-Line Data Collection | | Yes | Yes |
| SMART III - Off-Line Read Scanning with Defect Reallocation | | Yes | Yes |

*Technical Specifications*

| | |
|---|---|
| RoHS Compliance | Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. From July 1, 2006, RoHS substances will be virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).<br><br>Prior to this date, customers interested in purchasing RoHS compliant product should contact their local HP sales or distribution office to determine specific configuration status. |

| | |
|---|---|
| Service and Support | On-site Warranty and Service Note 1: This three-year (3-1-1), limited warranty and service offering delivers three years of parts and one year of both labour and on-site repair. Response time is next business-day Note 2: and includes free telephone support Note 3: 24 x 7. Global coverage Note 2: ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labour. |
| | NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. |
| | NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country. |
| | NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries. |

| | | |
|---|---|---|
| AC97 Integrated Realtek ALC655 Audio | Type | Integrated |
| | AC '97 Stereo Codec | Yes |
| | FM Synthesis Support | Yes – Yamaha XG Lite |
| | OPL3 FM Synthesis Support | Yes |
| | Sound Blaster Compatibility | Yes |
| | Audio Jacks | Microphone-In (20-K ohm Input Impedance); rear stereo and front analog microphone ports available except for USDT which has front stereo microphone only<br>Line-In (12-K ohm Input Impedance)<br>Line-Out * (less than 800 ohms Output Impedance, expects at least a 10-K ohm load)<br>Headphone-Out (2.5 Ohms Output Impedance, expects at least a 32-ohm load) |
| | NOTE: *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally. | |
| | Sampling | 7 kHz – 48 kHz |
| | Wavetable Syntheses (software) | Yes – GM and FM Midi Support, Direct Music and Down Loadable Soundset (4 Meg DLS Level 1 and 2 Support) |
| | 3D Positional Sound | No |
| | Digital Audio | Yes |
| | Analog Audio | Yes |
| | Number of Channels on Line-Out (mono/stereo) | Stereo (Left & Right channels) |
| | Internal Audio Speaker Power Rating | 3W |
| | Internal Speaker | Yes |
| | Hardware Equalizer for Internal Speaker | Fixed 7 Band ParametricEQ |
| | External Speaker Jack (Line-Out) | Yes |

| | | |
|---|---|---|
| **Broadcom NetXtreme Gigabit Ethernet LAN on Motherboard** (LOM) | **Connector** | RJ-45 |
| | **Controller** | Broadcom 5751 PCI-Express LAN Controller |
| | **Memory** | Integrated 72KByte frame buffer memory |
| | **Network data rates supported** | 10Mbps-Half Duplex, 10Mbps-Full Duplex/100Mbps-Half Duplex, 100Mbps Full Duplex /1000Mbps |
| | **Compliance** | IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | **Bus architecture** | PCI-Express 1.0a |
| | **Data path width** | x1 |
| | **Data transfer mode** | Bus-master DMA |
| | **Hardware certifications** | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |
| | **Power requirement** | 1.45 watts maximum |
| | **Boot ROM support** | Yes |
| | **LEDs** | 2; #1 on for link and flashes off for activity; #2 green for 1000Mbps, yellow for 100Mbps, off for 10Mbps |
| | **Auto MDI-X** | Automatic MDI crossover is supported (eliminates need for crossover cables) |
| | **Statistics** | SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z Clause 30) |
| | **Teaming** | Supported (additional NICs required) |
| | **Package** | 196-pin BGA |
| | **Environmental** | Operating temperature 32° to 131°F (0° to 55° C) |
| | | Operating humidity 85% at 131° F (55° C) |
| | **Dimensions** | 0.59 x 0.59 in (15 x 15 mm) |
| | **Management capabilities** | ACPI, WoL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility |
| | **Alerting** | ASF 1.1 |
| **Intel PRO/1000 GT Gigabit PCI NIC** | **Connector** | RJ-45 |
| | **Controller** | Intel 82541PI Gigabit Controller |
| | **Memory** | Integrated 64KB configurable transmit receive buffer memory |
| | **Data rates supported** | 10/100/1000 Mbps |
| | **Compliance** | IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | **Bus architecture** | PCI 2.3 |
| | **Data path width** | 32-bit, 33/66 MHz bus interface |
| | **Data transfer mode** | Bus-master DMA |
| | **Hardware certifications** | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |
| | **Power requirement** | (800mA) 4watts @ +5VDC |
| | **Boot ROM support** | Yes |

| | | |
|---|---|---|
| Network transfer rate | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus) | |
| Environmental | Operating temperature | 32° to 131°F (0° to 55° C) |
| | Operating humidity | 85% at 131° F (55° C) |
| Dimensions | 6.4 x 4.8 x 0.8 in (16.3 x 12.1 x 1.9 cm) | |
| Management capabilities | ACPI, WOL and DMI 2.0, S5 WOL, WMI, PXE 2.0, RPL | |

**2006 Agere PCI 56K International SoftModem**

| | |
|---|---|
| Data Transmission | Technology speeds: 56,000 Kbps maximum downstream data, controllerless<br>NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions. |
| Data Speeds | (Upload only)<br>33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 |
| Data Standards | ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103 |
| Fax Speeds | 14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s |
| Fax Mode Capabilities | ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2 |
| Error Correction and Data Compression | V.44, 42bis, V.42 and MNP2-5 |
| Power Management | ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements |
| Upgradeability | Driver upgradeable for future enhancements |
| Video | ITU-T V.80 video ready interface |
| Other | TIA/EIA 602 standard AT command set<br>Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface<br>Optional ring wakeup signal |
| Operating Temperature | 32° to 158° F (0° to 70° C) |
| Operating Humidity | 20% to 90%, non-condensing |
| Power | Requires a 3.3-V auxiliary power rail on PCI bus<br>Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load |
| Chipset | Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support |
| Dimensions (L X H) | Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets |
| Connection | Single RJ-11 connector |
| Other Features | Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support |
| Safety | UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark |

| | |
|---|---|
| EMC | FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8 |
| Telecom | FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals<br>Not available in Korea or the Republic of South Africa. |
| Health | Bare PCB material compliant to 94V-0 or better (marked as such) |
| Other | PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant |

*Technical Specifications - Graphics*

| | | |
|---|---|---|
| **Integrated Radeon X300 based graphics** (ATI Radeon Xpress 200M chipset) | **3D/2D Controller** | Full Microsoft DirectX® 9 based with Shader 2.0 support, full precision floating point pixel pipeline, 2x, 4x, or 6x Anti-Aliasing, hidden surface removal using 16, 24, or 32-bit Z-Buffering, and support for 12-bit per pixel formats. Support for Microsoft's DirectDraw, Double Buffering, Virtual Sprites, Transparent Blit, and Masked Blit. |
| | **VGA/DVI Controller** | Integrated |
| | **Bus Type** | PCI Express™ x16 for optional graphics upgrade. |
| | **RAMDAC** | Integrated |
| | **Memory** | HYPERMEMORY™ technology offers optional dedicated Local Frame Buffer configuration for a 32-bit or 64-bit interface and up to 128MB of memory. UMA mode operation uses from 32MB up to 256MB of shared system memory. |
| | **Controller Clock Speed** | 300 MHz |
| | **Overlay Planes** | Back end overlay supporting Motion Adaptive De-Interlacing |
| | **Maximum Colour Depth** | 32 bits/pixel |
| | **Maximum Vertical Refresh Rate** | Supports resolutions up to 2045x1536 @ 32bpp. |
| | **Multi-display Support** | SURROUNDVIEW™ support for up to four monitors with an ATI discrete graphics card. Up to 2 displays can be supported via the motherboard's VGA and DVI-D connectors. An additional 2 displays can be supported via the ATI discrete graphics card. Dual independent display modes are supported. |
| | **Graphics/Video API Support** | Microsoft DirectX 9, DirectXVA®, VMR7, VMR9, GDI/GDI+; OpenGL® 1.4. |

| | | | |
|---|---|---|---|
| **ATI Radeon x300 SE PCI Express Graphics Accelerators** (64 MB and 128 MB) | **Dimensions** (H x W) | 6.6 x 2.7 in (16.77 x 6.89 cm) | |
| | **Weight** | 4.2 oz (119 g) | |
| | **Bus Type** | PCI Express (x16 lanes) | |
| | **Maximum Vertical Refresh Rate** | 85 Hz | |
| | **Display Support** | Integrated 400MHz RAMDAC | |
| | **Display Max Resolution** | 2048 x 1536 | |
| | **Board Display Options** | **64 MB Card Display Option** | **128 MB Card Display Option** |
| | | VGA + TV<br>VGA supports analog CRT or flat panel. | DVI-I + TV<br>DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector)<br>DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle) |
| | | TV Connector is a 7-pin mini-DIN (also allowing 4-pin S-Video without adaptor) | TV Connector is a 7-pin mini-DIN (also allowing 4-pin S-Video without adaptor) |

| | | |
|---|---|---|
| **Board Configuration**<br>64 MB Frame Buffer | **Specification** | **Description** |
| | Graphics Chip | RADEON X300 SE PCI Express |
| | Core clock | 325 MHz |
| | Memory clock | 200 MHz |
| | Frame buffer | 64 MB DDR |
| | Memory I/O | 64 bit |
| | Memory Configuration | 4 pcs 8Mx16 DDR |
| **Board Configuration**<br>128 MB Frame Buffer | **Specification** | **Description** |
| | Graphics Chip | RADEON X300 SE PCI Express |
| | Core clock | 200 MHz |
| | Memory clock | 200 MHz |
| | Frame buffer | 128 MB DDR |
| | Memory I/O | 64 bit |
| | Memory Configuration | 4 pcs 16M x 16 DDR |
| **Memory type** | DDR1 | |
| **Maximum memory** | 128 MB | |
| **Operating Temperature** | 50° to 122° F (10° to 50° C) | |
| **Languages Supported** | 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish | |
| **Voltage** | 1.2 V and 1.8 V power rails used for PCI Express. | |
| **Core Power** | 10 W (Max ASIC power)<br>18 W (Max Board power) | |
| **Option Kit Contents** | • ATI RADEON X300 SE PCI Express graphics card with full height bracket attached<br>• Low profile bracket<br>• Software CD with graphics drivers<br>• Warranty documentation | |
| **Compliance Standards** | **EMC Emissions:**<br>a) FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use<br>b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment<br>c) Canadian Standard ICES-003 is equivalent to CISPR22<br>d) Taiwanese Standard BSMI – if specified<br>e) Japanese VCCI – if specified<br>f) Australian C-Tick – if specified<br><br>**EMC Immunity:**<br>CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement<br><br>**Safety:**<br>UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements. | |

| | | |
|---|---|---|
| ATI RADEON X1300 PCIe Graphics Card (256 MB) | Bus Type | PCI Express (x16 lanes) |
| | Maximum Vertical Refresh Rate | 85 Hz |
| | Display Support | Integrated 400 MHz RAMDAC |
| | Display Max Resolution | 2048 x 1536 |
| | Board display options | DVI-I + TV<br>DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector)<br>DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle)<br>TV connector is a 4-pin mini-DIN S-video connector |
| | Board Configuration | Specification: Description<br>Graphics Chip: RV515<br>Core clock: 450 MHz<br>Memory clock: 250 MHz<br>Frame buffer: 256 MB DDR2 |
| | Languages Supported | 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish |
| | Core Power | 25 W (Max board power) |
| | Option Kit Contents | • ATI RADEON X1300 PCIe graphics card with full height bracket attached<br>• Low profile bracket<br>• DVI-to-VGA Adapter<br>• Software CD with graphics drivers<br>• Warranty documentation |
| | Compliance Standards | EMC Emissions:<br>a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use<br>b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment<br>c) Canadian Standard ICES-003 is equivalent to CISPR22<br>d) Taiwanese Standard BSMI<br>e) Japanese VCCI<br>f) Australian C-Tick<br><br>EMC Immunity:<br>CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.<br><br>Safety:<br>UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements. |

*Technical Specifications - Graphics*

| | | | |
|---|---|---|---|
| ATI RADEON X1600XT (256 MB DH) FH PCIe Graphics Card | Bus Type | PCI Express (x16 lanes) | |
| | Maximum Vertical Refresh Rate | 85 Hz | |
| | Display Support | Integrated 400 MHz RAMDAC | |
| | Display Max Resolution | 2560 x 1600 digital, 2048 x 1536 analog | |
| | Board Display Options | 2 DVI-I ports (one port supports dual link DVI). DVI-I supports an analog CRT or flat panel with a VGA connector via the provided DVI-I to VGA adapter | |
| | | 4-pin mini-DIN S-video connector for TV output | |
| | Board Configuration | Specification | Description |
| | | Graphics chip | RV530 |
| | | Core clock | 590 MHz |
| | | Memory clock | 690 MHz |
| | | Frame buffer | 256 MB GDDR3, 128 bit wide |
| | Core Power | 56 W (Max board power) | |

| | | | | |
|---|---|---|---|---|
| 7200 rpm Serial ATA Hard Drives | 40-GB | Capacity | 40,020,000,000 bytes | |
| | | Height | 1 inch (2.54 mm) | |
| | | Width | Media diameter: 3.5 in (8.89 cm)<br>Physical size: 4 in (10.2 cm) | |
| | | Interface | Serial ATA | |
| | | Synchronous Transfer Rate (Maximum) | 1.5 Gb/s | |
| | | Buffer | 2 MB | |
| | | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | | Average | 8.5 ms |
| | | | Full-Stroke | 18.0 ms |
| | | Rotational Speed | 7,200 rpm | |
| | | Logical Blocks | 78,165,360 | |
| | | Operating Temperature | 32° to 140° F (0° to 60° C) | |
| | 80-GB | Capacity | 80,026,361,856 bytes | |
| | | Height | 1 in (2.54 cm) | |
| | | Width | Media diameter: 3.5 in (8.89 cm)<br>Physical size: 4 in (10.2 cm) | |
| | | Interface | Serial ATA (3.0 Gb/s) | |
| | | Synchronous Transfer Rate (Maximum) | Up to 3 Gb/s | |
| | | Buffer | 8 MB | |
| | | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 2.0 ms |
| | | | Average | 9.3 ms |
| | | | Full-Stroke | 21 ms |
| | | Rotational Speed | 7,200 rpm | |
| | | Logical Blocks | 156,301,488 | |
| | | Operating Temperature | 41° to 131° F (5° to 55° C) | |

*Technical Specifications - Hard Drives*

| | | | |
|---|---|---|---|
| 160-GB | Capacity | 163,928,604,672 bytes | |
| | Height | 1 in (2.54 cm) | |
| | Width | Media diameter: 3.5 in (8.89 cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA (3.0 Gb/s) | |
| | Synchronous Transfer Rate (Maximum) | Up to 3 Gb/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 0.9 ms |
| | | Average | 9.3 ms |
| | | Full-Stroke | 18 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 320,173,056 | |
| | Operating Temperature | 41° to 131° F (5° to 55° C) | |
| 250-GB | Capacity | 250,059,350,016 bytes | |
| | Height | 1 in (2.54 cm) | |
| | Width | Media diameter: 3.5 in (8.89 cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA (3.0 Gb/s) | |
| | Synchronous Transfer Rate (Maximum) | Up to 3 Gb/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | Average | 8.5 ms |
| | | Full-Stroke | 18 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 488,397,168 | |
| | Operating Temperature | 41° to 131° F (5° to 55° C) | |

*Technical Specifications - Input/Output Devices*

| | | | |
|---|---|---|---|
| Standard Keyboard (PS/2 or USB) | Physical characteristics | Keys | 104, 105, 106, 107, 109 layout (depending upon country) |
| | | Dimensions (L x W x H) | 18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm) |
| | | Weight | 2 lb (0.9 kg) minimum |
| | Electrical | Operating voltage | + 5VDC ± 5% |
| | | Power consumption | 50-mA maximum (with three LEDs ON) |
| | | System interface | USB Type A plug connector |
| | | ESD | CE level 4, 15-kV air discharge |
| | | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| | | Microsoft PC 99 - 2001 | Functionally compliant |
| | Mechanical | Languages | 38 available |
| | | Keycaps | Low-profile design |
| | | Switch actuation | 55-g nominal peak force with tactile feedback |
| | | Switch life | 20 million keystrokes (using Hasco modified tester) |
| | | Switch type | Contamination-resistant switch membrane |
| | | Key-leveling mechanisms | For all double-wide and greater-length keys |
| | | Cable length | 6 ft (1.8 m) |
| | | Microsoft PC 99 - 2001 | Mechanically compliant |
| | | Acoustics | 43-dBA maximum sound pressure level |
| | Environmental | Operating temperature | 50° to 122° F (10° to 50° C) |
| | | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | | Operating shock | 40 g, six surfaces |
| | | Non-operating shock | 80 g, six surfaces |
| | | Operating vibration | 2-g peak acceleration |
| | | Non-operating vibration | 4-g peak acceleration |
| | | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence |
| | | Drop (in box) | 42 in (107 cm) on concrete, 16-drop sequence |
| | Approvals | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC | |
| | Ergonomic compliance | ANSI HFS 100, ISO 9241-4, and TUVGS | |

*Technical Specifications - Input/Output Devices*

| | | | |
|---|---|---|---|
| 2-Button Scroll Mouse (PS/2 or USB) | Scroll Wheel | 8 mm | |
| | Maximum Rotation Speed | 30 mm/s | |
| | Switch Type | Light force micro-switch | |
| | Switch Life | 1 million operations | |
| | Mechanical Life | Minimum 200,000 revolutions | |
| | Environmental | Operating Temperature | 50° to 122° F (10° to 50° C) |
| | | Non-operating Temperature | -22° to 140° F (-30° to 60° C) |
| | | Operating Humidity | 10% to 90% (non condensing at ambient) |
| | | Non-operating Humidity | 20% to 80% (non condensing at ambient) |
| | | Operating Shock | 40 g, 6 surfaces |
| | | Non-operating Shock | 80 g, 6 surfaces |
| | | Operating Vibration | 2 g peak acceleration |
| | | Non-operating Vibration | 4 g peak acceleration |
| | Electrical | Operating Voltage | + 5VDC ± 10% |
| | | Power Consumption | 15mA |
| | | System Consumption | PS/2 mini-din connector |
| | | ESD | CE level 4, 15 kV air discharge |
| | | EMI-RFI | Conforms to FCC rules for a Class B computing device |
| | | PC98 | Functionally compliant |
| | Mechanical | Resolution | 400 ± 20% DPI |
| | | Tracking Speed | 10 in/s maximum |
| | | Acceleration | 100 in/s |
| | | Switch Actuation | 85 g nominal peak force |
| | | Switch Life | 1,000,000 operations (using Hasco modified tester) |
| | | Cable Length | 2 m |
| | | PC98-99 | Mechanically compliant |
| | Regulatory Approvals | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick | |

*Technical Specifications - Input/Output Devices*

| | | | |
|---|---|---|---|
| HP PS/2 Optical Scroll Mouse | Dimensions (H x L x W) | 3.95 x 6.21 x 11.7 cm (1.56 x 2.44 x 4.61 in) | |
| | Weight | 4.44 oz (126 g) | |
| | Environmental | Operating temperature | -32° to 104°F (0° to 40° C) |
| | | Non-operating temperature | -4° to 140°F ( -20° to 60° C) |
| | | Operating humidity | 10% to 90% (non condensing at ambient) |
| | | Non-operating humidity | 10% to 90% non condensing |
| | | Operating shock | 40 g, 6 surfaces |
| | | Non-operating shock | 80 g, 6 surfaces |
| | | Operating vibration | 2 g peak acceleration |
| | | Non-operating vibration | 4 g peak acceleration |
| | | Drop (out of box) | 80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face |
| | Electrical | Operating voltage | 5 VDC ± 10% |
| | | Power consumption | 100mA |
| | | System consumption | PS/2 mini-din connector |
| | | ESD | CE level 4, 15 kV air discharge |
| | | EMI-RFI | Conforms to FCC rules for a Class B computing device |
| | | Microsoft PC99 – 2001 | Functionally compliant |
| | Mechanical | Resolution | 400 ± 20% DPI |
| | | Tracking speed | 10 in/s (25.4 cm/s) maximum |
| | | Acceleration | 100 in/s/s (2.54 m/s/s) |
| | | Switch actuation | 61 g nominal peak force |
| | | Switch life | 3,000,000 operations (using Hasco modified tester) |
| | | Switch type | Low force micro-switches |
| | | Tracking mechanism life | 155 mi (250 km) at average speed of 10 in/s |
| | | Cable length | 6 ft (1.8 m) |
| | | Microsoft PC99 – 2001 | Mechanically compliant |
| | Scroll wheel | Width | 8 mm |
| | | Diameter | 1.01 in (25.6 mm) |
| | | Maximum rotation speed | 48 rats/sec |
| | | Switch type | Light force micro-switch |
| | | Switch life | 1 million operations |
| | | Mechanical life | Minimum 200,000 revolutions |
| | Regulatory approvals | Compliant | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC |

*Technical Specifications - Optical Storage*

| | | | |
|---|---|---|---|
| **48X Max CD-ROM Drive** | **Interface** | ATAPI IDE | |
| | **Data Buffer** | 16.6 Mbps | |
| | **Data Transfer Rate** | Sustained—150 Kbps minimum (audio) | Variable (CD)—3,000 to 7,200 Kbps |
| | **Disk Rotation Technology** | CAV (Constant Angular Velocity) | |
| | **Access Time** (ms) | Random: <100 ms | Full-stroke seek: <150 ms |
| | **Average Access Time** | < 80 ms | |
| | **Cache Buffer** (standard/maximum) | 128 KB | |
| | **Disk Formats Read** | Multi-session Photo CD, multi-read CD-ROM, CD text, audio CD, CD-I, CD-RW, CD-R, CD-Extra, CD-ROM XA | |
| | **Disk Formats Written** | None | |
| | **Disk Capacity** (CD) | 650 MB | |
| | **Block Size** | Mode 1 – 2,048 bytes | |
| | | Mode 2 – 2,340/2,336 bytes | |
| | | CD-DA – 2,352 bytes | |
| | | CD-XA – 2,328 bytes | |
| | **Diameter** | 12 cm; 8 cm | |
| | **Thickness** | 1.2 mm | |
| | **Track Pitch** | 1.6 µm | |
| | **Audio Output Level** | Line-out—0.7 V @ 47 Kohm | Headphone—0.6 V @ 32 ohm |
| | **Startup Time** | <7 seconds (typical); < 30 seconds with multi-session | |
| | **Operating Conditions** | Temperature | 41° to 113° F (5° to 45° C) |
| | | Relative Humidity | 10% to 80% |
| | **Dimensions** (H x W x D, maximum) | 1.7 x 5.9 x 8.2 in (4.3 x 15.0 x 20.8 cm) | |
| | **Weight** | 2.6 lb (1200 g) | |
| | **MPEG Playback Graphics Solution Support** | None | |

| | | |
|---|---|---|
| **48X/24X/48X CD-RW Drive** | **Orientation** | Either horizontal or vertical |
| | **Disc Loading Mechanism** | Half-height, tray load |
| | **Interface Type** | ATAPI IDE |
| | **Dimensions—external** (W x H x D) | 7.99 x 5.88 x 1.71 in (203 x 149.5 x 43.5 mm) |
| | **Weight** | 2.6 lb (1.2 kg) |
| | **Disc Diameter** | 12 cm, 8 cm |
| | **Disc Thickness** | 1.2 mm |
| | **Track Pitch** | 1.6 µm |
| | **Disc Centre Hole Diameter** | 15 mm |
| | **Reference Scanning Velocity** | 1.2 m/s |

| | | |
|---|---|---|
| **Recording/Playing Time** | 80 minutes with CD-R media | |
| **Read Only Disc Parameters** | **Formats and Modes Supported** | CD-ROM-Mode 1; CD-ROM XA-Mode 2 (forms 1 and 2); CD digital audio; CD Extra; CD-I-Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD |
| | **Capacity** | 185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm) |
| | **Block Size** | Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 and 2,368 bytes |
| **Writeable Disc Parameters** | **Disc Type** | CD-R and CD-RW |
| | **Write Methods** | Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet |
| | **Format and Modes Supported** | CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD |
| | **Capacity** | 185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm) |
| | **Block Size** | Mode 1-2,048 bytes; mode 2, form 1-2,048 and 2,352 bytes; mode 2, form 2-2,352 bytes; CD-DA ---2,352 bytes |
| **Access Times** (typical) | **Random** | < 120 ms |
| | **Full Stroke** | < 200 ms |
| **Data Transfer Rates** | **Sustained** | CD-R write-1,800 KB/s (12X)<br>CD-R write-2400 KB/s (16X)<br>CD-RW write (1-4X media) -600 KB/s (4X)<br>CD-RW write (4-10X media) -1,500 KB/s (10X)<br>CD-RW write (4-12X media) -1,800 KB/s (12X)<br>CD-RW read-3,600 KB/s (24X)<br>Digital audio extraction (minimum) -7,200 KB/s (48X) |
| | **Variable** | CD-RW write-2,400 to 3,600 KB/s (16X to 24X)<br>CD-RW write-2,400 to 4,800 KB/s (16X to 32X)<br>CD-RW write-2,400 to 6,000 KB/s (16X to 40X)<br>CD-RW write-2,400 to 7,200 KB/s (16X to 48X)<br>CD-ROM, CD-R read-1,500 to 7,200 KB/s (10X to 48X) |
| **Data Transfer Modes** | ATA PIO mode 4 (16.7MB/s) ; ATA multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s) ;ATA UltraDMA mode 1 (24 MB/s) ; ATA UltraDMA mode 2 (33 MB/s) - default. | |
| **Cache Buffer** | 2 MB (minimum) | |
| **Start-up Time** (single) | < 7 seconds typical | |
| **Start-up Time** (multi-session) | < 30 seconds typical | |

*Technical Specifications - Optical Storage*

| | | | |
|---|---|---|---|
| | Stop Time | < 4 seconds | |
| | Power | Source | Four-pin, DC power receptacle |
| | | DC power requirement | 5 VDC ± 5%—100 mV ripple p-p<br>12 VDC ± 5%—200 mV ripple p-p |
| | | DC current | 5 VCD < 1A (typical)<br>< 1600 mA (maximum) |
| | | | 12 VCD < 600 mA (typical)<br>< 1.4A (maximum) |
| | | | Total Drive Power (Standby mode) < 2.5 watt |
| | Audio Output Level | 0.7 Vrms | |
| | Configuration Jumper Block | Master, slave and cable select modes | |
| | Data Interface Connector | 50-pin IDE interface | |
| | Environmental (all conditions, non-condensing) | Temperature (operating) | Operating 41° to 122° F (5° to 50° C) |
| | | Relative Humidity (operating) | 10% to 85% |
| | | Maximum Wet Bulb Temperature (operating) | 84° F (29° C) |

| | | | |
|---|---|---|---|
| 16X/48X DVD-ROM Drive | Height | 5.25-in, half-height | |
| | Interface Type | ATAPI | |
| | Dimensions– External, Excluding Bezel (W x H) | 5.88 x 1.71 in (149.5 x 43.5 mm) | |
| | Disc Diameter | 12 cm, 8 cm | |
| | Disc Thickness | 1.2 mm | |
| | Track Pitch | 1.6 μm (CD), 0.74 μm (DVD) | |
| | Disc Centre Hole Diameter | 15 mm | |
| | Disc Formats | DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R, DVD+R DL ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW | |
| | Disc Capacity | DVD-ROM | 4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R), 8.5 GB (DVD+R DL) |
| | | CD-ROM | 540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm) |
| | Block Size (bytes) | DVD-ROM - 2048; CD-ROM Mode 0 - 2352; CD-ROM Mode 1 - 2352, 2340, 2336, 2048; CD-ROM Mode 2 - 2352, 2340, 2336, 2048 | |

*Technical Specifications - Optical Storage*

| | | |
|---|---|---|
| **Access Times** (typical reads, including settling) | **DVD-ROM Single Layer** | 120 ms (typical) |
| | **CD-ROM Mode 1** | 90 ms (typical) |
| | **Full Stroke DVD** | 240 ms (seek) (typical) |
| | **Full Stroke CD** | 160 ms (seek) (typical) |
| **Maximum Data Transfer Rates** | **CD-ROM Read** | 7200 KB/s (up to 48X) |
| | **DVD-ROM Read** | 21,600 KB/s (16X) Max |
| **Data Transfer Modes** | PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s) | |
| **Power** | **Source** | Four-pin, DC power receptacle |
| | **DC Power Requirement** | 5 VDC ± 5% – 100 mV ripple p-p |
| | | 12 VDC ± 5% – 200 mV ripple p-p |
| | **DC Current** | 5 VDC – <800 mA typical, < 1000 mA maximum |
| | | 12 VDC – < 870 mA typical |
| **Audio Output Level** | 0.7 Vrms (typical) | |
| **Configuration Jumper Block** | Master, slave, and cable select modes | |
| **Data Interface Connector** | 40-pin, shrouded and keyed, flat ribbon | |
| **Environmental** (all conditions non-condensing) | **Temperature** (operating) | 41° to 122° F (5° to 50° C) |
| | **Relative Humidity** (operating) | 10% to 85% |
| | **Maximum Wet Bulb Temperature** (operating) | 86° F (30° C) |
| **Certifications, Approvals** | MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, SEMKO, NEMKO, DEMKO, FIMKO, EN 60825-1, UL 60950, and CSA C22.2 60950-2000. | |

*Technical Specifications - Removable Storage*

| | | | |
|---|---|---|---|
| 1.44-MB Diskette Drive | LED Indicators (front panel) | 3.5 in (88.9 mm) | |
| | Read/Write Capacity per diskette (high/low density) | Green | |
| | Drive Supported | 1.44 MB/720 KB | |
| | Drive Height | One | |
| | Drive Rotation | One-third | |
| | Transfer Rate (high/low) | 300 rpm | |
| | Bytes/Sector | 500/250 Kb/s | |
| | Sectors/Track (high/low) | 512 | |
| | Tracks/Side (high/low) | 18/9 | |
| | Access Times | 80/80 | |
| | | Track-to-Track (high/low) | 3/6 ms |
| | | Average (high/low) | 169/94 ms |
| | | Settling Time | 15 ms |
| | | Latency Average | 100 ms |
| Zip 250 Drive | Interface | ATAPI IDE | |
| | Media format supported | Zip disk | |
| | Media capacity | 250 MB | |
| | Access time | 29 ms (average) | |
| | Drive rotational speed | 2,941 rpm | |
| | Size | Fits into a 5.25-inch bay (with bracket) | |
| | Data transfer rate | Maximum sustained | 2.4 Mbps |
| | | | 1.4 Mbps |
| | | | 1.4 Mbps (100 MB), 2.4 MB/s (250 MB) |
| | | | 0.3 Mbps (100 MB), 2.4 MB/s (250 MB) |
| | | | 11.1 Mbps |
| | Operating conditions | Temperature | 50° to 125° F (10° to 51.5° C) |
| | | Humidity | 20% to 80% |

*Technical Specifications - Removable Storage*

| | | | |
|---|---|---|---|
| HP Drive Key II | Dimensions (HxWxD) | 0.32 x 0.63 x 2.67 in (0.8 x 1.6 x 6.8 cm) | |
| | Storage Capacity | 256 MB | |
| | Weight | 0.05 lb (0.02 kg) | |
| | Transfer Rates | Read | Capable of 6.0 MB/s sustained read speed in USB 2.0 system |
| | | Write | Capable of 6.0 MB/s sustained write speed in USB 2.0 system |
| | Operating Temperature | 41° to 122° F (5° to 50° C) | |
| | Non-operating Temperature | -22° to 140° F (-30° to 60° C) | |
| | Option Kit Contents | HP Drive Key II, documentation | |
| HP 16-in-1 Media Card Reader | USB interface | USB 2.0 High-speed device via PCI card or pass -through via internal USB port of system board | |
| | Advance protocol support | • Supports hardware ECC (Error Correction Code) function<br>• Supports hardware CRC (Cyclic Redundancy Check) function<br>• Supports MS 4-bit parallel transfer mode<br>• Supports MS-PRO 4-bit parallel transfer mode<br>• Supports SD 4-bit parallel transfer mode<br>• Supports high-speed 50 MHz SD 4-bit card (version 1.1)<br>• Support high-speed 52 MHz MMC 8-bit card (version 4.x) | |
| | Supported media types | • Supports CompactFlash Card Type I (CF I), CompactFlash Card Type II (CF II),MicroDrive (MD)<br>• Supports 3.3V SmartMedia Card (SM), SmartMedia ROM (SM ROM), xD-Picture Card (xD)<br>• Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard (MMC), Secure MultiMediaCard (Secure MMC), ROM Type MultiMediaCard (MMC ROM), Reduced Size MultiMediaCard (RS MMC), MultiMediaCard 4.0 (MMC Plus), Reduced Size MultiMediaCard 4.0 (MMC Mobile)<br>• Support Memory Stick (MS), Memory Stick ROM (MS ROM), MagicGate Memory Stick (MG), Memory Stick Select, Memory Stick Duo (MS Duo), Memory Stick PRO (MS-PRO), Memory Stick PRO Duo (MS PRO Duo) | |
| | Mechanical | Length (3.5") | 124.7 cm |
| | | Width (3.5") | 101.6 cm |
| | | Height (3.5") | 25.4 cm |
| | | Length (5.25") | 171.6 cm |
| | | Width (5.25") | 148.9 cm |
| | | Height (5.25") | 42.7 cm |

| | | |
|---|---|---|
| Environmental | Operational environmental extremes | Test Parameters/Conditions - Power applied, unit operating on system ±5% nominal supply voltage.<br>10°C 10% R.H. = 24 hours<br>10°C 90% R.H. = 24 hours<br>20°C 90% R.H. = 24 hours<br>30°C 90% R.H. = 24 hours<br>40°C 90% R.H. = 24 hours<br>50°C 90% R.H. = 24 hours<br>50°C 10% R.H. = 24 hours |
| | Storage environmental extremes | Test Parameters/Conditions<br>60°C @ 80% R.H. for 96 hours<br>-30°C @ 20% R.H. for 48 hours<br>No power applied<br>Delta °C < 1.0°C/min<br>Delta % R.H. < 1.5% R.H./min |
| Approvals | | USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2<br>FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T |

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